Table of Opportunities for Sustaining Natural Communities, by Ecological Landscape

Background

The purpose of this Ecological Opportunities table is to provide a quick way to determine the best places in the state (within distinctive Ecological Landscapes) for sustaining different natural communities (natural community types are described in the Appendix entitled "Natural Communities"). Part 1 of the table ranks the importance of each Ecological Landscape in maintaining or restoring the various natural community types. Part 2 lists the historic and current abundance of natural communities.

"Sustaining natural communities" means ensuring that a given natural community type will be present and has high potential to maintain its natural composition, structure, and ecological function over a long period of time (e.g., 100 years). Estimating the likely degree of sustainability required looking at each natural community type from a landscape perspective across the state or region to determine whether occurrences of communities are large enough and/or connected enough to support the composition, structure and ecological function of a community type over time. The goal of sustaining natural communities is to manage for natural community types that historically occurred in a given landscape.

This goal of sustainability does not preclude a "working landscape" where both traditional (e.g., forest and agricultural products) and non-traditional (e.g., ginseng, sphagnum moss, etc.) products are extracted from an area. People are dependent on natural resources, so to maintain economic sustainability over the long term, natural resources must be sustained. Such a philosophy allows for human use so long as the capacity of natural resources for self-renewal is not compromised. However, removing natural resources in an unsustainable way will not benefit natural communities, our economy, or the human population in the long term.

This table can help guide land and water management activities so that they are compatible with the local ecology of the Ecological Landscape and also maintain important components of ecological diversity and function. It should help to identify the most appropriate community types that could be considered for management activities within each Ecological Landscape. Therefore, this table is intended for broad land and water management applications. For example, this table should be useful for planning and management activities related to:

- working forests that provide timber and other goods and services;
- wildlife and fisheries areas, as well as state, county, and local parks designated for recreational pursuits;
- selection of natural areas established to protect both rare and representative natural communities; and
- assisting other conservation interests by providing an appropriate ecological context for their projects.

The information presented here can help focus management of natural communities on areas where the potential for success is greatest. It will not, however, answer questions regarding appropriate scale (how big), degree of connectivity, or how to create a desirable landscape pattern through these management efforts. Those more detailed steps require further analysis.

Some community types may need restoration because they have been greatly reduced in size or frequency of occurrence across part or all of their state range. Some communities have been greatly modified, resulting in a simplified or otherwise altered composition or structure, limiting the ecological functions that are necessary for sustainability. Restoration could include reestablishing species composition or vegetation structure. It could also include restoring a missing, diminished, or altered ecological process or influence, such as fire or water flow. Managers also need to consider landscape effects such as fragmentation of patches, reduction in patch size, change in the pattern of community types, and connectivity. Representation of all successional stages associated with a given community type is an important consideration to ensure that those elements of diversity most in need of attention are maintained somewhere across a regional landscape. For example, in many forest community types older successional stages are now rare or absent in much of Wisconsin and are especially important to consider when planning restoration projects. In a few cases, such as northern wet-mesic forest (i.e., white cedar swamp), young stands are virtually nonexistent outside of a few locations with special circumstances. Restoration opportunities will be discussed in greater detail in the individual Ecological Landscape chapters.

Data Sources for Table

Primary data sources for the table include the Natural Heritage Inventory (NHI) statewide database on natural communities, and selected state and regional summaries prepared by WDNR and other agencies and organizations. Other data sources used include: Forest Inventory and Analysis (FIA) data; the Southern Forest, Savanna and Grassland Ecosystem research project; The Nature Conservancy's Ecoregional Planning initiative; presettlement vegetation data; the Chequamegon-Nicolet National Forest Landscape Analysis and Design (LAD) process; and the Northwest Pine Barrens study.

The purpose of the NHI data is to document occurrences of rare plant and animal species, and both rare and representative natural communities. Not all community types have received equivalent inventory attention. For widespread and common types, the focus has been on large, relatively undisturbed occurrences, or the older (and/or rarest) successional stages of many forest communities. For rare types such as mesic prairie and algific talus slope, the goal is to identify and inventory as many potentially viable examples as possible. Communities that have seldom been conservation priorities, such as alder thicket or shrub-carr, have received less attention than other types. For types that have only recently been discovered or described in Wisconsin (e.g., alvar), data on distribution and abundance may be incomplete, making it difficult to assess their status at this time.

Description of Table

The first part of the table is organized by community type, and displays ecological opportunities for sustaining natural communities by Ecological Landscape. The following four attributes are included in the table.

Inventory Confidence. The confidence placed in the knowledge of natural community types occurring within each Ecological Landscape (EL) is indicated by two categories. The first identifies those EL's that have not been well inventoried; for these areas additional data are needed. There is incomplete knowledge about what natural community types exist and their extent. The second category is used to indicate that there are sufficient data or knowledge about the presence of natural community types within an EL.

Ecological Opportunities. Opportunities for sustaining natural communities are listed as major, important, present, or absent. A major opportunity is defined as a community type that is represented by many significant occurrences within an Ecological Landscape, or that the EL is appropriate for major restoration activities (see individual EL chapters for restoration potential for community types). An important opportunity means that a community type is not extensive or common in an EL but has a minimum of one to several significant intact occurrences that should be considered for protection and/or management. Or it means that the natural community type is restricted to just one or a few ELs within the state and should be considered for management there because of limited geographic distribution and a lack of opportunities elsewhere. If a community type is listed as present it means that better management opportunities exist in other Ecological Landscapes or that management opportunities have not been adequately evaluated. A blank (absent) indicates that the community does not occur or has not been documented there.

The intent of this table is to provide a statewide perspective on the best places in the state to manage Wisconsin's natural communities. If a community type is found in an Ecological Landscape but is not listed as a major or important opportunity for management in the table, it does not mean that the community type should not be managed or preserved if there are important reasons for doing so locally.

Natural Communities. The natural communities presented in this table are mostly derived from the work of Curtis (1959), with additions and revisions by Epstein et al. (2000). The major headings (e.g., northern forest, southern forest, oak savanna, etc.) follow the natural communities presented in the Biodiversity Report (Addis et al., 1995). To simplify the table and make it more useable, some natural community types from the NHI list have been combined and presented under the more inclusive and familiar Curtis type name. Other types have yet to be documented across all of their potential state range, have been insufficiently studied, or may be so rare that management opportunities in Wisconsin are unclear at this time. The table reflects the following changes from the working list presented by Epstein *et al.* (2000):

- Northern Mesic Forest includes Mesic Cedar Forest and Mesic Floodplain Terrace.
- Northern Wet Forest includes Black Spruce Swamp and Tamarack Swamp.

- Forested Seep, Talus Forest and Felsenmeer are recently described types that occurs in small patches across parts of the Wisconsin landscape. They are not included in the table but will be mentioned in the descriptions of those Ecological Landscapes where they occurs.
- Tamarack Fen was renamed Southern Tamarack Swamp (formerly tamarack relict, to split tamarack forests that occur south of the Tension Zone from those of the north).
- Sand Prairie includes Sand Barrens.
- Open Bog includes Muskeg and Poor Fen.
- Patterned Peatland was eliminated because it rarely occurs in Wisconsin and represents a complex of several distinct community types.
- Emergent Marsh includes Floating-leaved Marsh.
- Inland Beach includes Lacustrine and Riverine Mud Flats.

Community types that contain potentially important variants, associations, subtypes, and successional stages (e.g., aspen to hemlock-hardwood old growth) will be discussed in the EL chapters.

State Ranks. State ranks were taken from the NHI database to indicate how rare or threatened each community type may be. State ranks are defined in the footnote at the end of the table. State ranks are updated periodically, so users should check Bureau of Endangered Resources information for current community status.

The second part of the table organizes information on the relative abundance of community types both historically and at present. Historical abundance was determined by maps and analyses of vegetation described during the mid-1800's ("pre-EuroAmerican settlement" vegetation). Current abundance was determined primarily from NHI data but other sources were also referenced. Four categories of relative abundance are presented:

- Common historically and still common today.*
- Common historically but uncommon, rare, or severely degraded today.
- Uncommon historically and still uncommon today.
- Geographically restricted, meaning that these natural communities are only found in very specialized places or settings in the state (e.g., along the shores of the Great Lakes).
- Non existent historically, but rare, uncommon, or common today.**

* Note that even for those types which were common historically and remain relatively common today, some have been reduced in acreage from their former abundance, and most have been altered in some way (composition, structure, quality, scale, context or function). Also, some seral stages may be over or underrepresented.

** Note that these communities or features, referred to as Surrogate Communities, were created by human development or activities. They are utilized by native species during part or throughout all of their life cycles. In certain instances, they represent the best available resource for some critical need of a given species (e.g. tall buildings as nesting sites for peregrine falcons). In some cases, we know the extent of these features well (e.g. dredge spoil islands), while for others, they are difficult to quantify (e.g. railroad/utility corridors). As with natural communities, there are often factors that dictate how surrogate communities are used by species (e.g. proximity to a water body, type, and amount of use by humans). So, it can be extremely difficult to gauge what occurrences of surrogate communities will be utilized by what native species, and to what extent.

This table is not meant to encourage the creation of surrogate communities, but it recognizes that they may play an important role of a given species' life cycle. Certain surrogate communities can complement natural communities, and enhance their conservation values (e.g. prairies embedded within Conservation Reserve Program (CRP) lands) by increasing the effective area of the natural community. In Table 1, surrogate communities are not included (with the exception of Surrogate Grasslands and Impoundments/Reservoirs), but managers should be cognizant of their potential benefits to wildlife, and consider them when proposing or implementing management.

Part 1. Opportunities for Sustaining Wisconsin's Natural Communities by Ecological Landscape[a]. See Appendix entitled "Natural Communities" for definitions of Natural Community types. **xx = Major Opportunity** **x = Important Opportunity** **p = Present** **blank = Absent** See footnotes for definitions of Opportunities, State Ranks, and Inventory Confidence.	**State Rank**	**Superior Coastal Plain***	**Northwest Lowlands****	**Northwest Sands***	**North Central Forest***	**Northern Highland***	**Northeast Sands****	**Northern Lake Michigan Coastal***	**Central Lake Michigan Coastal***	**Forest Transition***	**Western Prairie****	**Western Coulee and Ridges***	**Southwest Savanna****	**Central Sand Plains****	**Central Sand Hills***	**Southeast Glacial Plains****	**Southern Lake Michigan Coastal****
Northern Forest																	
Boreal Forest	S2	xx	x		x	p	p	x									
Northern Dry Forest	S3	x	p	xx	p	x	xx	x						x	p		
Northern Dry-Mesic Forest	S3	x	x	xx	x	xx	xx	x	x	x	p	x		x	p	p	
Northern Mesic Forest (includes mesic cedar and floodplain terrace)	S4	x	x	p	xx	x	x	xx	x	xx	p	p		x	p		
Northern Wet-Mesic Forest	S3 S4	x	x	x	xx	x	xx	xx	x	xx		p			p	x	p
Northern Wet Forest	S4	x	xx	xx	xx	xx	x	x	x	xx	p	x		xx	xx	x	
Northern Hardwood Swamp	S3	x	p	x	xx	x	x	x	x	x		p		x	x	x	
Southern Forest																	
Southern Dry Forest	S3										p	xx	x	x	xx	xx	p
Central Sands Pine – Oak Forest	S3													xx	xx		
Southern Dry-Mesic Forest	S3								x	p	x	xx	x	xx	x	xx	x
Southern Mesic Forest	S3							p	x	p	x	xx	x	x	p	x	x
Southern Hardwood Swamp	S2								p			p				x	x
Floodplain Forest	S3	x		p	x	p	p	x	x	x	x	xx	p	xx	x	xx	p
White Pine – Red Maple Swamp	S2											x		xx			
Southern Tamarack Swamp	S2											x		x	x	xx	x
Hemlock Relict	S2											xx	x	p			
Pine Relict	S2											xx	x	p			
Savanna (Including Barrens types)																	
Oak Opening	S1										x	xx	xx		p	xx	x
Oak Woodland	S1										x	xx	xx	p	p	xx	p
Cedar Glade	S4							x	p		x	xx	p	p	p	x	
Pine Barrens	S2			xx		p	xx					x		xx	x		
Oak Barrens	S2			xx								xx		xx	x		
Great Lakes Barrens	S1	xx						p									
Shrub																	
Alder Thicket	S4	x	x	x	xx	x	x	p	p	x	p	x		xx	x	p	
Bog Relict	S3								p			p			x	xx	x
Shrub Carr	S4	x	p	p	x	x	p	xx	x	x	p	xx	p	xx	xx	xx	x

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Herbaceous (Grassland)																	
Dry Prairie	S3										x	xx	xx	x	x	xx	
Sand Prairie (includes Sand Barrens)	S2										x	xx	p	xx	x	p	
Dry-Mesic Prairie	S2										x	xx	xx	x	p	xx	p
Mesic Prairie	S1										xx	x	xx	p	p	xx	x
Wet-Mesic Prairie	S2											x	x	p	xx	xx	xx
Wet Prairie	SU										p	x	p	p	x	x	x
Bracken Grassland	S2					x	xx										
Northern Sedge Meadow	S3	x	xx	xx	xx	xx	x	xx	x	x	p	x		xx	x	x	
Southern Sedge Meadow	S3							x	x	p	p	x	p	x	xx	xx	x
Surrogate Grasslands[c]	NR	x	p	xx	p		p	x	x	x	xx	xx	xx	xx	x	xx	x
Herbaceous Open Wetland (Bog, Fen, Marsh)																	
Open Bog (includes Muskeg, Poor Fen)	S4	xx	xx	xx	xx	xx	x	p	p	x				xx	x		
Boreal Rich Fen	S2				x	x	x	xx									
Calcareous Fen (Southern)	S3											p		p	xx	xx	x
Shore Fen	S2	xx						x									
Emergent Marsh	S4	xx	x	xx	xx	xx	x	xx	x	x	xx	xx	p	x	xx	xx	x
Emergent Marsh - Wild Rice	S3	xx		xx	x	xx	p	p	p	p	p	x		p	p	x	
Submergent Marsh	S4	xx	x	xx	xx	xx	x	x	x	x	x	xx	p	x	xx	x	p
Submergent Marsh - Oligotrophic Marsh	S3			p		xx											
Coastal Plain Marsh	S1													x	xx		
Interdunal Wetland	S1	xx						x	x								
Ephemeral Pond	SU	p	p	p	xx	x	p	x	x	x	p	x	p		p	x	x
Miscellaneous Communities[b]																	
Algific Talus Slope	S1											xx					
Clay Seepage Bluff	S2	x						x	x								x
Alvar	S1							x	xx								
Bedrock Glade	S3		p		xx	p		p	x	x	x	xx		p	x		
Dry Cliff (Curtis' Exposed Cliff)	S4	xx	p		xx		x	xx	xx	x	x	xx	x	xx	p	xx	p
Moist Cliff (Curtis' Shaded Cliff)	S4	xx	p		xx		x	x	x	x	x	xx	x	x	x	x	p
Great Lakes Alkaline Rockshore	S2							xx									
Great Lakes Bedrock Shore	S2	x															
Great Lakes Dune	S2	xx						xx	xx								x
Great Lakes Beach	S2	xx						xx	xx								p
Inland Beach	S3			xx	p	x	p								x		
Great Lakes Ridge and Swale	S2	p						xx	xx								

Part 1. Opportunities for Sustaining Wisconsin's Natural Communities by Ecological Landscape. See Appendix entitled "Natural Communities" for definitions of Natural Community types. **xx = Major Opportunity** **x = Important Opportunity** **p = Present** **blank = Absent** **See footnotes for definitions of Opportunities, State Ranks, and Inventory Confidence.**	**State Rank**	**Superior Coastal Plain***	**Northwest Lowlands****	**Northwest Sands***	**North Central Forest***	**Northern Highland***	**Northeast Sands****	**Northern Lake Michigan Coastal***	**Central Lake Michigan Coastal***	**Forest Transition***	**Western Prairie****	**Western Coulee and Ridges***	**Southwest Savanna****	**Central Sand Plains****	**Central Sand Hills***	**Southeast Glacial Plains****	**Southern Lake Michigan Coastal****
Aquatic																	
Coldwater Stream	NR	xx	p	xx	xx	x	xx	p	p	xx	xx	xx	x	x	xx	p	
Coolwater Stream	NR	xx	x	xx	xx	xx	xx	x	x	xx	xx	xx	x	x	x	x	p
Impoundment/Reservoir[c]	NR	p	p	x	xx	x	x	x	p	xx	x	p	p	xx	xx	xx	x
Inland Lake (Drainage Lake, Seepage Lake, Spring Pond/Spring Run)	NR	p	p	xx	xx	xx	x	x	p	x	p			p	xx	xx	x
Lake Michigan	NR							xx	xx								xx
Lake Superior	NR	xx															
Warmwater River	NR	x	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	p	x	xx	xx	x
Warmwater Stream	NR	xx	x	x	xx	xx	p	xx	xx	xx	xx	p	xx	x	x	xx	xx

[a] This table does not suggest that the landscape should be restored to historic conditions. This may not be desirable or even possible because of human needs and changes to the environment (e.g., introduction of invasive species or large deer populations). This table also does not imply that we should continue with status quo management. We need to continue to improve and refine management to meet the needs of both people and diverse sustainable ecosystems.

Definitions:
Major Opportunity – type extensively represented by multiple significant occurrences, or EL is appropriate for major restoration activities.
Important Opportunity – type not extensive or common in EL but represented by 1 to several significant occurrences, or type restricted to 1 or few EL's.
Present – better opportunities exist on other EL's, or opportunities not adequately evaluated.
Absent – type absent, or no occurrences documented.

State Rank
S1= Critically imperiled in Wisconsin because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or some factor(s) making it vulnerable to extirpation.
S2= Imperiled in Wisconsin because of rarity (6 to 20 occurrences or few remaining individuals or acres) or some factor(s) making it very vulnerable to extirpation from the state.
S3= Rare or uncommon in Wisconsin (21 to 100 occurrences).
S4= Apparently secure in Wisconsin, with many occurrences.
S5= Demonstrably secure in Wisconsin and essentially ineradicable under present conditions.
SU= Possibly in peril in the state, but their status is uncertain. More information is needed.
NR= Not ranked.

Inventory Confidence
* Indicates that the Ecological Landscape has not been completely inventoried or that additional data are needed and that there is incomplete knowledge of what natural community types exist in the Ecological Landscape.
** Indicates that there are sufficient data or knowledge about the presence of natural community types within an Ecological Landscape.

[b] **Miscellaneous Communities** -- soil profile poorly developed or absent (usually bare sand or bedrock) in these communities, except for Forested Ridge and Swale.

[c] **Surrogate Communities** – communities or features created by human development or activities that are used by native species through part or all of their life cycles.

Part 2. Relative abundance of natural community types historically and at present.

Common Historically-Still Common

Northern Forest
Northern Dry-Mesic Forest
Northern Mesic Forest
Northern Wet-Mesic Forest
Northern Wet Forest
Northern Hardwood Swamp

Southern Forest
Southern Dry Forest
Central Sands Pine–Oak Forest
Southern Dry-Mesic Forest
Southern Mesic Forest
Southern Hardwood Swamp
Floodplain Forest

Shrub
Alder Thicket
Shrub Carr

Herbaceous (Grassland)
Northern Sedge Meadow
Southern Sedge Meadow

Herbaceous Open Wetland (Bog, Fen, Marsh)
Open Bog (includes Muskeg and Poor Fen)
Emergent Marsh
Submergent Marsh
Ephemeral Pond

Common Historically-Now Uncommon or Rare

Northern Forest
Northern Dry Forest

Savanna (Including Barrens types)
Oak Opening
Oak Woodland
Pine Barrens
Oak Barrens

Herbaceous (Grassland)
Dry Prairie
Dry-Mesic Prairie
Mesic Prairie
Wet-Mesic Prairie
Wet Prairie

Herbaceous Open Wetland (Bog, Fen, Marsh)
Emergent Marsh – Wild Rice

Uncommon Historically-Still Uncommon or Now Rare

Northern Forest
Boreal Forest

Southern Forest
Hemlock Relict
Pine Relict
White Pine - Red Maple Swamp
Southern Tamarack Swamp

Savanna (Including Barrens types)
Cedar Glade

Shrub
Bog Relict

Herbaceous Open Wetland (Bog, Fen, Marsh)
Calcareous Fen (Southern)
Boreal Rich Fen
Submergent Marsh - Oligotrophic Marsh

Herbaceous (Grassland)
Bracken Grassland
Sand Prairie (includes Sand Barrens)

Miscellaneous Types
Inland Beach

Geographically Restricted Types

Great Lakes Shorelines
Great Lakes Beach
Great Lakes Dune
Great Lakes Alkaline Rockshore
Great Lakes Bedrock Shore
Alvar
Herbaceous Open Wetland (Bog, Fen, Marsh)
Interdunal Wetland
Shore Fen
Savanna (Including Barrens types)
Great Lakes Barrens

Herbaceous Open Wetland (Bog, Fen, Marsh)
Coastal Plain Marsh

Miscellaneous Types
Algific Talus Slope
Bedrock Glade
Caves
Clay Seepage Bluff
Dry Cliff (Curtis' Exposed cliff)
Moist Cliff (Curtis' Shaded Cliff)
Great Lakes Ridge and Swale

Non Existent Historically, but Rare, Uncommon, or Common Today

Surrogate Communities

Agricultural Fields Surrogate Grasslands
Artificial Reefs
Dredge Spoil Islands
Forest Plantations
Impoundment/Reservoir
Mines & Gravel Pits
Quarry
Railroad/Utility Corridors
Roadside Ditches and Swales
Scrapes/Farm Ponds/Mitigated Wetlands
Structures (Barns, Bridges, Buildings, etc)
Urban Greenspace